

FORAGE SUITABILITY GROUP**Sandy**

FSG No.: G034B3025CO
Major Land Resource Area: 034B - Warm Central Desertic Basins and Plateaus
Land Resource Unit 34B-3: 12-14 inches precipitation zone

PHYSIOGRAPHIC FEATURES

The land resource area 34B-3 occurs in Northeastern Utah and Western Colorado. Utah Counties included in this area are Carbon, Emery, Grand, Duchesne and Uintah. Colorado counties included in this area are Mesa, Delta, Montrose, Garfield, Rio Blanco and Moffat.

The Soils on this group are found on cuestas, mesas and plateaus.

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	4000	7000
Slope (percent):	0	15
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Very low	High

CLIMATIC FEATURES

The climate for this land resource area is considered arid or semi arid. The yearly total annual precipitation for this resource area ranges from 12-14 inches. Following are data for a representative climate station within this precipitation zone. For data from a climate station nearer to your location, access the national Water and Climate Center at <http://www.wcc.nrcs.usda.gov/>, or visit your local Natural Resources Conservation Service Field Office.

Temperature Data Related to Growth of Plants										
County/ State	Climate Station	Elevation (Feet)	Growing Degree-Day Units †		Growing Season					
					Length of Period		Average Date of 32° F		Average Date of 28° F	
			Base 50°F	Base 40°F	32°F	28°F	Last frost in Spring	First Frost in Fall	Last Killing freeze in Spring	First Killing freeze in Fall
Delta/CO	Cedaredge	6830	2525	4615	115	139	June 1	Sep. 15	May 16	Sep. 25

† **Growing Degree-Day Units** are computed as the difference between the daily average temperature and the base temperature. (Daily Average Temperature - Base Temperature) One unit is accumulated for each degree Fahrenheit the average temperature is above the base temperature. Negative numbers are discarded.

Example: If the day's high temperature was 95 and the low temperature was 55, the base 50 heating degree-day units is $[(95 + 55) / 2] - 50 = 25$. This is done for each day of the month and summed.

Precipitation and Temperature, Monthly and Annual Average		
Month	Precipitation (inches)	Temperature (°F)
	Cedaredge Station	Cedaredge Station
January	0.88	26.4
February	0.79	32.4
March	1.22	39.5
April	0.91	47.5
May	1.14	56.6
June	0.75	66.1
July	0.95	72.1
August	1.20	69.8
September	1.38	61.7
October	1.47	50.7
November	1.13	38.0
December	1.06	28.5
Annual Average	12.87	49.1

Climate Station	Location	From	To
CO1440	Cedaredge	1961	1991

SOIL PROPERTIES

This group consist of moderately deep to very deep, somewhat excessively drained to excessively drained, coarse to moderately coarse textured soils. Available water capacity is low and permeability is very slow to rapid.

Drainage Class:	Somewhat excessively drained	To	Excessively drained
Permeability Class: (0 - 40 inches)	Very slow	To	Rapid
Frost Action Class:	Low	To	Low

	<u>Minimum</u>	<u>Maximum</u>
Depth:	20	>60
Organic Matter (percent): (surface layer)	0.6	3.0
Electrical Conductivity (mmhos/cm): (0 - 24 inches)	0	0
Sodium Absorption Ratio: (0 - 12 inches)	0	0
Soil Reaction (1:1) Water (pH): (0 - 12 inches)	6.6	7.8
Available Water Capacity (inches): (0 - 60 inches)	3	6
Calcium Carbonate Equivalent (percent): (0 - 12 inches)	0	5

ADAPTED SPECIES LIST

The followings forage species are adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of these species can be accessed at the following web site: <http://plants.usda.gov/>

Cool Season Grasses	Plant Symbol	Dryland	Irrigated
Altai wildrye	LEYMU	NS	F
Bluebunch wheatgrass	PSSPS	F	NS
Bottlebrush squirreltail	ELELE	G	NS
Canada wildrye	ELCA4	NS	F
Crested wheatgrass	AGCR	G	NS
Indian ricegrass	ACHY	G	NS
Intermediate wheatgrass	THIN6	NS	G
Meadow brome	BRBI	NS	G
Muttongrass	POFEF	F	NS
Needleandthread	HECOC8	G	NS
Newhy hybrid wheatgrass	ELHO	NS	G
Orchardgrass	DAGLG	NS	F
Pubescent wheatgrass	THIN6	NS	G
Reed canarygrass	PHAR3	NS	F
Russian wildrye	PSJU3	NS	F
Siberian wheatgrass	AGFR	F	NS
Slender wheatgrass	ELTRS	NS	F
Smooth brome	BRINI2	NS	F
Streambank wheatgrass	ELLA3	F	NS
Tall fescue	LOAR10	NS	F
Thickspike wheatgrass	ELLAR	F	NS
Warm Season Grasses	Plant Symbol	Dryland	Irrigated
Alkali sacaton	SPAI	NS	F
Galleta grass	PLJA	F	NS
Little bluestem	SCSC	NS	F
Switchgrass	PAVIV	NS	G
Legumes	Plant Symbol	Dryland	Irrigated
Alfalfa	MESAS	NS	G
Birdsfoot trefoil	LOCO	NS	G
Cicer milkvetch	ASCI	NS	F
Sainfoin	ONVI	NS	F
White clover	TRRE3	NS	F
Yellow sweetclover	MEOF	NS	F
Other Perennial Forbs	Plant Symbol	Dryland	Irrigated
Louisiana sage	ARLU	F	F
Small burnet	SAMI3	NS	F

G - Good adaptation for forage production on this group of soils in this MLRA
 F - Fair Adaptation but will produce at its highest potential
 NS - Species is not suited or adapted to the site and should not be planted

PRODUCTION ESTIMATES

Production estimates listed here should only be used for making general management recommendations. On site production information should always be used for making detailed planning and management recommendations.

Listed below are low and high production estimates for the more commonly grown forages for this group. The high forage production estimates are based on dense, vigorous stands of climatically adapted, superior performing cultivars. Stands are properly fertilized to obtain high yields. Pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. Optimum beginning and ending grazing heights are adhered to, if stands are grazed. Adequate time is allowed for plant recovery before entering winter dormancy under both harvest regimes.

These production estimates represent total annual above ground plant production on an air-dry-matter basis. Production estimates for hay and grazing can be calculated from these numbers by multiplying them by a harvest efficiency factor. Seventy- percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency depends upon the grazing management system applied, and usually ranges from 25 to 50 percent efficiency.

Forage Crop	Dryland		Irrigated	
	Production Range (lb/ac)		Production Range (lb/ac)	
	Low	High	Low	High
Alfalfa	NS*	NS	10000	19000
Alkali sacaton	NS	NS	4600	9100
Altai wildrye	NS	NS	2600	9200
Birdsfoot trefoil	NS	NS	6100	12400
Bluebunch wheatgrass	850	1300	NS	NS
Bottlebrush squirreltail	1000	1600	NS	NS
Canada wildrye	NS	NS	4600	8600
Cicer milkvetch	NS	NS	6300	12600
Crested wheatgrass	1000	1600	NS	NS
Galleta grass	1000	1600	NS	NS
Indian ricegrass	1000	1600	NS	NS
Intermediate wheatgrass	NS	NS	6400	14200
Little bluestem	NS	NS	3200	9100
Louisiana sage	200	400	300	600
Meadow brome	NS	NS	6600	13000
Muttongrass	800	1200	NS	NS
Needleandthread	1000	1600	NS	NS
Newhy hybrid wheatgrass	NS	NS	6400	12300
Orchardgrass	NS	NS	4300	8700
Pubescent wheatgrass	NS	NS	6100	13600
Reed canarygrass	NS	NS	4600	9400
Russian wildrye	NS	NS	4300	9200
Sainfoin	NS	NS	4300	9000
Siberian wheatgrass	850	1300	NS	NS
Slender wheatgrass	NS	NS	5700	12000
Small burnet	NS	NS	1100	2100

Forage Crop	Dryland Production Range (lb/ac)		Irrigated Production Range (lb/ac)	
	Low	High	Low	High
Smooth brome	NS	NS	3800	7800
Streambank wheatgrass	800	1200	NS	NS
Switchgrass	NS	NS	7100	11500
Tall fescue	NS	NS	6200	12500
Thickspike wheatgrass	800	1200	NS	NS
White clover	NS	NS	5000	10700
Yellow sweetclover	NS	NS	6400	11250

*NS = not suited

FORAGE GROWTH CURVES

Growth Curve Number: CO1221
Growth Curve Name: Crested Wheatgrass
Growth Curve Description: Grand Valley, Dryland Pasture
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	5	15	30	35	5	5	5	0	0	0

Growth Curve Number: CO1222
Growth Curve Name: Pubescent Wheatgrass
Growth Curve Description: Grand Valley, Dryland Pasture
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	20	40	25	5	5	5	0	0	0

Growth Curve Number: CO1231
Growth Curve Name: Cool Season Grasses
Growth Curve Description: Grand Valley, Irrigated Pasture
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	30	30	5	10	15	5	0	0

Growth Curve Number: CO1232
Growth Curve Name: Warm-Season Grasses
Growth Curve Description: Grand Valley, Irrigated Pasture
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	0	5	20	40	25	5	5	0	0

Growth Curve Number: CO1234
Growth Curve Name: Brome/Orchard
Growth Curve Description: Grand Valley, Irrigated Pasture
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	10	20	30	25	10	5	0	0	0

Growth Curve Number: CO1236
Growth Curve Name: Alfalfa/Cool-Season Grass Mix
Growth Curve Description: Grand Valley, Irrigated Pasture
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	5	10	30	20	15	10	5	5	0	0

Growth Curve Number: CO1254
Growth Curve Name: Alfalfa
Growth Curve Description: Irrigated 3-Cuttings for Hay Graze Aftermath
Percent Production by Month:

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
0	0	0	5	25	20	20	20	10	0	0	0

SOIL LIMITATIONS

The **low available water capacity** of these soils limits the production of forage species. These soils are also naturally low in fertility due to **low organic matter** content, and can be deficient in major nutrients to adequately sustain forage stands.

MANAGEMENT CONSIDERATIONS

Water and **nutrient management** are critical with this group of soils in order to maintain forage production.

FSG DOCUMENTATION

Similar FSGs:

FSG ID	FSG Narrative
G034B1025CO	Sandy group in land resource area 34-B1 is similar, however, yearly precipitation is less (8-10 inches)

References:

United States Department of Agriculture, Soil Conservation Service. Land Resource Regions and Major Land Resource Areas of The United States. Agriculture Handbook 296. Washington, D.C.

United States Department of Agriculture, Natural Resources Conservation Service. National Water and Climate Center. <http://www.wwc.nrcs.usda.gov/>

United States Department of Agriculture, Natural Resources Conservation Service. Official Soil Series Descriptions. <http://soils.usda.gov/classification/main.htm>

United States Department of Agriculture, Natural Resources Conservation Service. 1997. National Range and Pasture Handbook. Grazing Lands Technology Institute.

Brummer, J.E., C.H., Pearson, and J. J. Johnson. 2000. Colorado Forage Research 1999. Alfalfa, Irrigated Pastures and Mountain Meadows. Colorado State University, Agricultural Experiment Station, Technical Report TR00-6.

United States Department of Agriculture, Natural Resources Conservation Service. 2002. Colorado Plant Materials Technical Note No. 59 (Revised).

United States Department of Agriculture, Natural Resources Conservation Service. The PLANTS database. 2002. <http://plants.usda.gov/>.

Personal Communication from various Technical Specialists from Colorado Natural Resources Conservation Service.

Cooley, A.W., C.H., Pearson and J. Brummer. Intermountain Grass and Legume Forage Production Manual. Colorado State University Cooperative Extension.

Montana State University. 2000. Montana Interagency plant Materials Handbook for Forage Production, Conservation, Reclamation, and Wildlife. MSU Extension Service EB 69.

State Correlation:

This site has been correlated with the following states: UT

Forage Suitability Group Approval:

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